

REMARKS

Claims 3-5, 8-16, and 23-27 are all the claims presently pending in the application.

Claims 1, 2, 6, 7, and 17-22 are canceled without prejudice or disclaimer.

Applicant gratefully acknowledges that **claims 11-16 and 23-27** are **allowed**.

However, for the reasons set forth below, Applicant respectfully submits that all of the claims are allowable over the prior art of record.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1, 2, 6, and 7 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Athreya (U.S. Patent Publication No. 2002/0027906 A1).

Claims 3-5 and 8-10 stand rejected under 35 U.S.C. § 102(e) as being anticipated by O'Dell (U.S. Patent Publication No. 2005/0157711 A1).

Claims 17-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over O'Dell in view of Athreya.

Claims 20-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over O'Dell in view of Athreya, in further view of Miki (U.S. Patent Publication No. 2004/0264505 A1).

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

In conventional systems and methods, an apparatus (e.g., a PPP termination apparatus 501 as illustrated in Figure 19) which discriminates each subscriber who tries to access the Internet and has a function for ATM processing must be installed at an entrance to the backbone network 601. Such an apparatus must be added every time the number of subscribers increases. In addition, the PPP termination apparatus 501 is often installed near the backbone network 601 to which packets from many subscribers are sent upon multiplexing (e.g., see specification at page 6, lines 7-16).

According to the conventional access network system, for example, as shown in Figure 19, since the overall access network system is formed by using the AAL5 layer, the overall system inevitably becomes complicated.

Also, in the conventional methods, as the number of subscribers who access the Internet increases, an apparatus for performing PPP processing as processing indispensable to connection of the subscribers to the backbone network of the Internet must be added. Such an apparatus may be installed in a place as near to the subscribers as possible, i.e., in an apparatus for providing Internet services (e.g., the ATM SW 40n in Fig. 19). In this case, it is required to avoid complication of PPP, complication of its system, complication of a management system for the system, and the like (e.g., see specification at page 6, lines 17-27, and page 7, lines 1-4).

The claimed invention, on the other hand, provides a multiplexing method and apparatus, demultiplexing method and apparatus, access network system, subscriber multiplexing/demultiplexing apparatus, and protocol termination apparatus which can multiplex PPP packets on the basis of MAC addresses and the like, demultiplex the packets on the basis of MAC or IP addresses, and simplify an arrangement for PPP

processing by using these multiplexing and demultiplexing processes (e.g., see specification at page 7, lines 6-16).

Thus, according to one exemplary aspect of the claimed invention described in the specification (all reference numerals herein being used for the Examiner's clarity only and not for limiting the claims), the subscriber multiplexing/demultiplexing apparatuses 4n can multiplex Ethernet/IEEE 802.3 frame packets from the respective subscriber apparatuses 2nm on the basis of the MAC addresses, output the resultant signal as an Ethernet/IEEE 802.3 signal, and output each Ethernet/IEEE 802.3 frame packet in the Ethernet/IEEE 802.3 signal. The subscriber multiplexing/demultiplexing apparatuses 4n can also demultiplex an Ethernet/IEEE 802.3 frame packet from the access gateway 61 on the basis of the MAC address.

In addition, processing in each subscriber apparatus 2nm, each subscriber multiplexing/demultiplexing apparatuses 4n, and access gateway 61 can be performed by using MAC addresses, and the AAL5 layer required in the prior art is not required. The exemplary aspects of the claimed invention also make it possible to eliminate the necessity of an ATM switch in the conventional methods and systems, thereby simplifying the system arrangement. Thus, under this system simplification, QoS of each subscriber can be ensured (e.g., see specification at page 30, lines 20-27, and page 31, lines 1-12).

For example, independent claim 3 exemplarily defines, *inter alia*, a demultiplexing method, including adding, to each of the communication signals, an identification address preassigned to a predetermined signal identifying section through which a communication signal passes in a multiplexing system including the multiplexed signal transmitting section and the communication signal receiving section, and

outputting each of the communication signals, extracting the identification address from the output signal, and demultiplexing the multiplexed signal for each of the communication signals on the basis of the extracted identification address.

Independent claim 5 exemplarily defines, *inter alia*, a demultiplexing method of demultiplexing a multiplexed signal obtained by multiplexing a plurality of packets into packets, including extracting an IP address from each packet in the received multiplexed signal, and demultiplexing the multiplexed signal into PPP packets on the basis of the extracted IP addresses.

Independent claim 8 exemplarily defines, *inter alia*, a demultiplexing apparatus including address extracting means, connected to the multiplex communication path, for extracting an IP address of each packet in the multiplexed signal received from the multiplex communication path, and demultiplexing means for demultiplexing the multiplexed signal into the respective packets on the basis of the IP addresses of the respective packets extracted by the address extracting means.

Accordingly, the claimed invention multiplexes or demultiplexes the respective communication signals on the basis of the extracted identification addresses. That is, the claimed invention, can multiplex, for example, PPP packets on the basis of extracted identification addresses (e.g., MAC addresses and the like), thereby simplifying an arrangement for PPP processing (e.g., see specification at page 7, lines 6-16).

Thus, according to one exemplary aspect of the claimed invention, processing in each subscriber multiplexing apparatus can be performed by using extracted identification addresses (e.g., MAC addresses), such that the AAL5 layer required in the conventional methods is *not* required. The exemplary aspects of the claimed invention also make it possible to eliminate the necessity of an ATM switch in the conventional methods and

systems, thereby simplifying the system arrangement. Thus, under this system simplification, QoS of each subscriber can be ensured (e.g., see specification at page 30, lines 20-27, and page 31, lines 1-12).

II. THE PRIOR ART REJECTIONS

A. Claims 1, 2, 6, and 7 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Athreya.

Claims 1, 2, 6, and 7 are canceled without prejudice or disclaimer. Therefore, the rejection of these claims has been rendered moot.

For the foregoing reasons, the Examiner is requested to withdraw this rejection.

B. Claims 3-5 and 8-10 stand rejected under 35 U.S.C. § 102(e) as being anticipated by O'Dell.

The Examiner alleges that O'Dell discloses all of the features of the claimed invention. Applicant respectfully submits, however, that there are features of the claimed invention which are not disclosed or suggested by O'Dell. Therefore, Applicant traverses this rejection.

Independent claim 3

Independent claim 3 recites, *inter alia*, a demultiplexing method, including:

adding, to each of the communication signals, an identification address preassigned to a predetermined signal identifying section through which a communication signal passes in a multiplexing system including the multiplexed signal transmitting section and the communication signal receiving section, and outputting each of the communication signals; extracting the identification address from the output signal; and

demultiplexing the multiplexed signal for each of the communication signals on the basis of the extracted identification address (emphasis added).

Accordingly, the claimed invention demultiplexes the respective communication signals on the basis of the extracted identification addresses. That is, the claimed invention, can demultiplex, for example, PPP packets on the basis of extracted identification addresses (e.g., MAC addresses and the like), thereby simplifying an arrangement for PPP processing (e.g., see specification at page 7, lines 6-16).

Thus, according to one exemplary aspect of the claimed invention, processing in each subscriber multiplexing/demultiplexing apparatus can be performed by using extracted identification addresses (e.g., MAC addresses), such that the AAL5 layer required in the conventional methods is *not* required. The exemplary aspects of the claimed invention also make it possible to eliminate the necessity of an ATM switch in the conventional methods and systems, thereby simplifying the system arrangement. Thus, under the claimed system simplification, QoS of each subscriber can be ensured (e.g., see specification at page 30, lines 20-27, and page 31, lines 1-12).

Applicant submits, however, that O'Dell does not disclose or suggest at least the claimed "*demultiplexing the multiplexed signal for each of the communication signals on the basis of the extracted identification address*" as defined by claim 3.

Instead, O'Dell discloses using an ATM Network 117, including an ATM switch 207, for MUX/DEMUX 207 (see O'Dell at Figure 1; see also O'Dell at paragraph [0044]).

Indeed, Applicant submits that the teachings of O'Dell are comparable to the conventional systems described in the "Background of the Invention" of the present

application (e.g., see Figure 19; see also specification at page 2, lines 21-27; page 5, line 9, to page 6, line 16).

Thus, O'Dell does not disclose or suggest at least the claimed "*demultiplexing the multiplexed signal for each of the communication signals on the basis of the extracted identification address*" as defined by claim 3.

For the foregoing reasons, Applicant submits O'Dell does not disclose or suggest all of the features of independent claim 3. Therefore, the Examiner is requested to reconsider and withdraw this rejection and to permit independent claim 3 (and dependent claim 4) to pass to immediate allowance.

Independent claim 5

Independent claim 5 recites, *inter alia*, a demultiplexing method, including:

extracting an IP address from each packet in the received multiplexed signal; and demultiplexing the multiplexed signal into PPP packets on the basis of the extracted IP addresses (emphasis added).

Applicant submits, however, that O'Dell does not disclose or suggest at least the claimed "*demultiplexing the multiplexed signal into PPP packets on the basis of the extracted IP addresses*" as defined by claim 5, for somewhat similar reasons as those set forth above with respect to claim 3.

Independent claim 8

Independent claim 8 recites, *inter alia*, a demultiplexing apparatus, including:

address extracting means, connected to the multiplex communication path, for extracting an identification address, for each of the communication signals, which is added to each of the communication signals in the multiplexed signal received from the multiplex communication path and preassigned to a predetermined signal identifying section through which a communication signal passes in a demultiplexing section

including said multiplexed signal transmitting section and said communication signal receiving section; and
demultiplexing means for demultiplexing the multiplexed signal into the respective communication signals on the basis of the identification addresses of the respective communication signals which are extracted by said address extracting means
(emphasis added).

Applicant notes that independent claim 8 defines some of the features of the invention in “means-plus-function” language. The “means-plus-function” recitations properly should be construed as covering the specific arrangement of elements disclosed in the specification and drawings (and then “reasonable” equivalents under 35 U.S.C. § 112, sixth paragraph).

Applicant submits, however, that O’Dell does not disclose or suggest any structure, equivalents thereof, or identity of function necessary for at least the claimed “*demultiplexing means for demultiplexing the multiplexed signal into the respective communication signals on the basis of the identification addresses of the respective communication signals which are extracted by said address extracting means*” as defined by claim 8 and described in the specification, for somewhat similar reasons as those set forth above.

Therefore, the Examiner is requested to reconsider and withdraw this rejection and to permit independent claim 8 (and dependent claim 9) to pass to immediate allowance.

Independent claim 10

Independent claim 10 recites, *inter alia*, a demultiplexing apparatus, including:

address extracting means, connected to the multiplex communication path, for extracting an IP address of each packet in the multiplexed signal received from the multiplex communication path; and
demultiplexing means for demultiplexing the multiplexed signal into the respective packets on the basis of the IP

addresses of the respective packets extracted by said address extracting means (emphasis added).

Applicant notes that independent claim 10 defines some of the features of the invention in “means-plus-function” language. The “means-plus-function” recitations properly should be construed as covering the specific arrangement of elements disclosed in the specification and drawings (and then “reasonable” equivalents under 35 U.S.C. § 112, sixth paragraph).

Applicant submits, however, that O’Dell does not disclose or suggest any structure, equivalents thereof, or identity of function necessary for at least the claimed “demultiplexing means for demultiplexing the multiplexed signal into the respective packets on the basis of the IP addresses of the respective packets extracted by said address extracting means” as defined by claim 10 and described in the specification, for somewhat similar reasons as those set forth above.

Therefore, the Examiner is requested to reconsider and withdraw this rejection and to permit independent claim 10 to pass to immediate allowance.

For the foregoing reasons, O’Dell does not disclose or suggest all of the features of the claimed invention. Therefore, the Examiner is requested to reconsider and withdraw this rejection and to permit claims 3-5 and 8-10 to pass to immediate allowance.

C. Claims 17-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over O’Dell in view of Athreya.

Claims 17-19 are canceled without prejudice or disclaimer. Therefore, the rejection of these claims has been rendered moot.

For the foregoing reasons, the Examiner is requested to withdraw this rejection.

D. Claims 20-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over O'Dell in view of Athreya, in further view of Miki.

Claims 20-22 are canceled without prejudice or disclaimer. Therefore, the rejection of these claims has been rendered moot.

For the foregoing reasons, the Examiner is requested to withdraw this rejection.

III. FORMAL MATTERS

A. Formal Drawings

Applicant reiterates the request for the Examiner to acknowledge receipt of and approve the formal drawings filed on January 18, 2002.

B. Priority under 35 U.S.C. § 119

Applicant also reiterates the request for the Examiner to check Box 12(a)(1) of the Office Action Summary indicating that the certified copies of the priority document have been received.

IV. CONCLUSION

In view of the foregoing, Applicant submits that claims 3-5, 8-16, and 23-27, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone

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22

number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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